REMARKS

Applicant is in receipt of the Office Action mailed June 8, 2004. Claim 83 has been cancelled. Claims 1, 5, 8, 18-19, 42, 44-45, 53, 56, 64, 67, 72, 74, 75-77, and 79-82, have been amended to more completely claim the invention. Thus, claims 1, 4-20, 42-47, 53, 55-58, and 64-82 remain pending in the case. Further consideration of the present case is earnestly requested in light of the following remarks.

Section 101 Rejections

Claims 1, 4-19, 42-47, 53, 55-58, and 64-82 were rejected under 35 U.S.C. 101 as being directed to non-statutory subject matter. Applicant has amended the independent claims to address this issue. More specifically, Applicant has amended the claims to emphasize the practical application and result of the invention, specifically, storing an automatically generated curve fit characterizing data.

Amended claim 1 recites:

1. (Currently Amended) A computer-implemented method for curve fitting, the method comprising:

(a) storing a plurality of data points in a memory of the computer;

(b) generating a curve based on two or more random points of the plurality of data points;

(c) testing the curve against a first subset of the plurality of data points, wherein the first subset is less than all of the plurality of data points, wherein said testing produces first test results;

(d) performing (b) and (c) a plurality of times to determine a curve which meets first criteria, wherein said performing (b) and (c) a plurality of times comprises performing (b) and (c) in an iterative manner until ending criteria are met; and

(e) if said first test results meet said first criteria, storing information regarding the curve, wherein said information specifies a curve fit of the plurality of data points.

Applicant notes that in the State Street Bank ruling, the Court stated:

"In *Alappat*,we held that data, transformed by a machine through a series of mathematical calculations to produce a smooth waveform display on a rasterizer monitor, constituted a practical application of an abstract idea (a mathematical algorithm, formula, or calculation), because it produced "a useful, concrete and tangible result"—the smooth waveform."

Applicant respectfully submits that the claims as currently amended produce a useful, concrete and tangible result, specifically, the generation and storage of a curve fit characterizing data. Removal of the Section 101 rejection is respectfully requested.

Section 102 Rejections

Claims 1, 4, 13, 15-17, 42, 43, 53, 72, 80, and 81 were rejected under 35 U.S.C. 102(b) as being anticipated by Roth (U.S. Patent No. 5,617,491). This rejection is respectfully traversed.

Regarding the Examiner's comments on Applicant's previous arguments against Roth, Applicant respectfully submits that the Examiner has mischaracterized Roth.

The Office Action cites Ross: "The final example shows the algorithm applied to situations where the outliers are not noise, but instead, make up *another geometric primitive*.", and "By simply applying the extraction process on the remaining outliers, the second geometric primitive could be extracted. The extraction process can thus be used to find a number of geometric primitives by such an iterative approach." The Office Action then asserts that since the extractions process is being applied on the remaining outliers, it can be inferred that these outliers were not previously tested as they were "remaining" outliers and therefore Roth does not necessarily test all the data points in the plurality of data points at one time and thus the inliers referred to in col. 5 lines 45-51 for example, can indeed be less than the total plurality of points. Applicant respectfully disagrees.

Applicant submits that the "remaining" outliers referred to in the cited portion of Roth are simply those points which were processed and tested during the first extraction process and which were determined to be outliers with respect to the first extracted geometric primitive. In other words, these points are those remaining after the first

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extraction process has determined the first geometric primitive, and has further determined which points are 'inliers' and which are 'outliers', where the 'inliers' are associated with the first primitive, and where the remaining points are the 'outliers', which are not associated with the first primitive (which determination certainly requires processing and testing). As Roth describes, these outliers are then processed and tested *a second time* to determine if yet another geometric primitive may 'fit' these remaining data. In other words, each time the extraction process is performed, the determined outliers may then serve as the next input data set to be processed and tested in a subsequent extraction process. Applicant thus notes that in Roth's system, for each application of the extraction process, *all* of the input data points are processed and divided into inliers and outliers, and that the determined outliers of each application of the extraction process form the input data set for the next application of the extraction process. Thus, for example, the outliers for a third application of the extraction process will have been processed and tested three times. Nowhere does Roth teach or describe applying the extraction process by processing only a subset of the input data for the process.

As noted in the previous response, Roth tests all the data points in a plurality of data points. Otherwise, Roth could not categorize <u>the inliers</u> and <u>the outliers</u>:

> Along with an equation of the best primitive, an extraction method determines which subset of the geometric data points belong to the primitive (the inliers) and ignores the rest (the outliers). The output of the primitive extraction process is the equation of the best primitive, along with a division of the input points into inliers and outliers. (Roth col 5, lines 45-51) (*emphasis added*)

In contrast, Applicant's invention as currently recited in pertinent part by claim 1 includes ". . . testing the curve against a first subset of the plurality of data points, <u>wherein the first subset is less than the plurality of data points,</u> wherein said testing produces first test results. . ." Applicant notes that this novel feature of Applicant's invention is a primary mechanism for the method's improved efficiency, in that the testing portion of the method (which involves computing distances and is thus

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computationally intensive per point), is greatly reduced with respect to the exhaustive case by only processing a subset of the points. Applicant respectfully submits that Roth does not teach, suggest, or provide motivation for this feature. In fact, in Roth's system, these distance computations are made for *each* point in the input set, and is thus quite computationally demanding. Therefore, Applicant respectfully submits that, at least for the reason presented, claim 1 is patentably distinguished and non-obvious over Roth. Accordingly, Applicant respectfully submits that claim 1 and those dependent thereon are allowable.

Claims 42, 72, 80, and 81 include limitations similar to claim 1, and so the arguments presented above apply with equal force to these claims 42, 72, 80, and 81, as well. Applicant respectfully submits that for at least the reason or reasons presented above, claims 42, 72, 80, and 81, and those claims respectively dependent thereon are patentably distinguished over Roth and are allowable.

Claim 53 includes limitations similar to claim 1, specifically, the feature ". . .test the curve against a first subset of the plurality of data points, to produce first test results, <u>wherein the first subset is less than the plurality of data points</u>. . .", and so the arguments presented above apply with equal force to claim 53, as well. Therefore, Applicant respectfully submits that, at least for the reason or reasons presented, claim 53 is patentably distinguished over Roth. Accordingly, Applicant respectfully submits that claim 53 and those dependent thereon are allowable.

Removal of the §102 rejection of claims 1, 4, 13, 15-17, 42, 43, 53, 72, 80, and 81 is respectfully requested.

Section 103 Rejections

Claim 20 was rejected under 35 U.S.C. 103(a) as being unpatentable over Roth in view of Silver et al. (U.S. Patent No. 6,408,109, hereinafter "Silver"). This rejection is respectfully traversed.

As Examiner is aware, the MPEP §2143.03 states: "If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is non-obvious. *In re Fine* , 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)." Therefore, Applicant respectfully submits that, at least for the reasons presented, claim 1 is patentably distinguished over both Roth and Silver, taken both singly and in combination. Accordingly, Applicant respectfully submits that claim 1 and those dependent thereon are allowable. Since claim 20 depends from claim 1, Applicant submits that claim 20 is patentably distinct and non-obvious over the cited references, and is thus allowable for at least the reasons presented above.

Additionally, as held by the U.S. Court of Appeals for the Federal Circuit in Ecolochem Inc. v. Southern California Edison Co., an obviousness claim that lacks evidence of a suggestion or motivation for one of skill in the art to combine prior art references to produce the claimed invention is defective as hindsight analysis. Moreover, the showing of a suggestion, teaching, or motivation to combine prior teachings "must be clear and particular . . .. Broad conclusory statements regarding the teaching of multiple references, standing alone, are not 'evidence'." *In re Dembiczak*, 175 F.3d 994, 50 USPQ2d 1614 (Fed. Cir. 1999). The art must fairly teach or suggest to one to make the specific combination as claimed. That one achieves an improved result by making such a combination is no more than hindsight without an initial suggestion to make the combination.

As disclosed above, Applicant's invention as currently recited in pertinent part by claim 1 includes ". . . testing the curve against a first subset of the plurality of data points, wherein the first subset is less than the plurality of data points, wherein said testing produces first test results. . ." Roth does not teach, suggest, or provide motivation for this feature. Silver does not teach, suggest, or provide motivation for this feature. Applicant thus submits that neither Roth nor Silver provides or even hints at a motivation to combine, and thus, that combining Roth and Silver to establish the §103 rejection is improper. Applicant further submits that ever were Roth and Silver properly combinable, which Applicant argues they are not, the resulting combination would still not produce Applicant's invention as represented by claim 20.

For example, as argued above, Roth nowhere teaches or suggests testing the curve against a first subset of the plurality of data points, wherein the first subset is less than the plurality of data points, wherein the plurality of data points comprises pixels of an image; and wherein the curve fitting method operates to perform edge detection on the image. Silver fails to correct this deficiency.

For example, as stated in the Abstract, Silver's method "includes the steps of: estimating gradient magnitude and direction at a plurality of regularly-spaced pixel points in the image so as to provide a plurality of estimates of gradient magnitude and direction, each such estimate being associated with a respective gradient point of a regularly-spaced gradient grid; using gradient direction associated with each gradient point to select a respective set of neighboring gradient points; comparing gradient magnitude associated with each gradient point with each gradient magnitude of the respective set of neighboring gradient magnitudes so as to determine which of the gradient magnitudes is a local maximum in approximately the gradient direction; and using the local maximum of gradient magnitude and a set of neighboring gradient magnitudes to determine an interpolated edge position along a one-dimensional gradient magnitude profile."

Nowhere does Silver teach or suggest testing the curve against a first subset of the plurality of data points, wherein the first subset is less than the plurality of data points. Applicant reminds the Examiner that per Interconnect Planning Corp. v. Feil, 774 F.2d 1132, 1143, 227 USPQ 543, 551 (Fed. Cir. 1985), "it is insufficient to select from the prior art the separate components of the inventor's combination, using the blueprint supplied by the inventor." Applicant submits that the Examiner has simply selected portions of the cited references using Applicant's claim 20 as a blueprint in an attempt to produce Applicant's invention as claimed, which is clearly improper.

Furthermore, Applicant notes that the resulting combination of Roth and Silver not only fails to teach all of the features and limitations of claim 20, but also actually teaches away from Applicant's invention. For example, the alleged combination system would necessarily process *every* data point in the input data set for each application of Roth's extraction process, and would also include Silver's estimating gradient magnitude and direction at a plurality of regularly-spaced pixel points in the image so as to provide a plurality of estimates of gradient magnitude and direction, each such estimate being

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associated with a respective gradient point of a regularly-spaced gradient grid. The combination would also include Silver's using gradient direction associated with each gradient point to select a respective set of neighboring gradient points; comparing gradient magnitude associated with each gradient point with each gradient magnitude of the respective set of neighboring gradient magnitudes so as to determine which of the gradient magnitudes is a local maximum in approximately the gradient direction; and using the local maximum of gradient magnitude and a set of neighboring gradient magnitudes to determine an interpolated edge position along a one-dimensional gradient magnitude profile. Thus, the alleged combination of Roth and Silver necessarily includes many features and limitations not included in claim 20, where the inclusion of these features in Applicant's invention would substantially undermine and actually preclude the efficiencies thereof.

Clearly, this combination teaches away from Applicant's invention as represented in claim 20.

Therefore, Applicant respectfully submits that, at least for the reasons presented, claim 20 is patentably distinguished and non-obvious over both Roth and Silver, taken both singly and in combination. Accordingly, Applicant respectfully submits that claim claim 20, and those claims dependent therefrom, are patentably distinct and non-obvious over the cited references, and are thus allowable for at least the reasons presented above. Removal of the §103 rejection of claim 20 is respectfully requested.

Applicant also respectfully asserts that numerous ones of the dependent claims recited further distinctions over the cited art. However, since the independent claims have been shown to be patentably distinct, a further discussion of the dependent claims is not necessary at this time.

CONCLUSION

Applicant submits the application is in condition for allowance, and an early notice to that effect is requested.

If any extensions of time (under 37 C.F.R. § 1.136) are necessary to prevent the above referenced application(s) from becoming abandoned, Applicant(s) hereby petition for such extensions. If any fees are due, the Commissioner is authorized to charge said fees to Meyertons, Hood, Kivlin, Kowert & Goetzel PC Deposit Account No. 50-1505/5150-52200/JCH.

Also enclosed herewith are the following items:

☒ Return Receipt Postcard

☐ Request for Approval of Drawing Changes

☐ Notice of Change of Address

☐ Check in the amount of $ for fees (   ).

☐ Other:

Respectfully submitted,

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